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STORAGE OF BULL SPERMATOZOA AT LOW TEMPERATURES

BY

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Much of the recent work on the biology of mammalian and avian spermatozoa has dealt with their behaviour *in vitro* and with optimal conditions of storage. This is especially true of the spermatozoa of farm animals, in which artificial insemination is being increasingly used. Temperature has long been recognised as one of the most important factors in survival of spermatozoa *in vitro*, and bull semen cooled slowly to about +4° C. can be stored satisfactorily for several days before use. Rapid cooling, on the other hand, is well known to be harmful to bull and ram spermatozoa (Willett, Fuller and Salisbury, 1940; Chang and Walton, 1940; Lasley, Mayer and Bogart, 1942).

Temperatures slightly below 0° C. may be tolerated under certain conditions. Thus, bull spermatozoa cooled slowly and stored at −1·2° C. showed high motility when warmed after ten days, but only slight motility after three months; the lowest temperature from which motile bull spermatozoa have been revived appears to be −5·6° C. (Morozov, 1940—quoted by Anderson, 1945). Temperatures which cause solidification of the medium are usually very injurious to spermatozoa—a result generally, but perhaps wrongly, ascribed to the formation of ice crystals. Human spermatozoa, however, are peculiar in that a large proportion will recover after short periods of freezing at moderately low temperatures (*e.g.*, −20° C.) and after long periods at −79° C. (solid carbon dioxide) or −196° C. (liquid air). Fowl spermatozoa behave much like those of mammals other than man when frozen in their natural medium, though a very few may recover from low temperatures. Recent work, however, has shown that the use of glycerol-containing diluents makes possible the complete revival of motility in fowl spermatozoa kept at −79° C. for long periods; this technique also assists the survival of human spermatozoa (Polge, Smith and Parkes, 1949). Removal of 90 per cent. or more of the water from the frozen preparation by vacuum distillation is compatible with the resumption of motility by a small proportion of spermatozoa when the material is reconstituted by the addition of water.

The present communication deals with the effect of glycerol on the revival of bull and goat spermatozoa from very low temperatures. Bull and goat semen was collected, cooled slowly to and stored at +2° C. and used on the same day. Pure glycerol was added to Wellcome semen diluent (3·92 per cent. sodium citrate adjusted to *p*H 6·7) to give solutions containing 10 per cent., 20 per cent., 30 per cent. and 40 per cent. glycerol respectively. 0·1 ml. of semen was measured into precipitin tubes, or 0·5 ml. into ampoules, and mixed with an equal quantity of diluent, giving a final concentration of 5 per cent., 10 per cent., 15 per cent. or 20 per cent. glycerol. The tubes, pipettes, semen and diluents used were all at +2° C. unless otherwise stated. Hanging drop preparations were examined under the microscope at +37° C. and estimates of the approximate percentage of motile spermatozoa were made. Samples of diluted semen were cooled to −79° C. at different rates in freezing mixtures made with solid carbon dioxide and alcohol. After periods varying from five minutes to 24 hours at −79° C. the specimens were thawed in a water bath at +40° C. Control tubes containing varying quantities of glycerol were kept at room temperature, or at +2° C., and examined at intervals.

Specimens of bull semen diluted to give final concentrations of 5 per cent., 10 per cent., 15 per cent. and 20 per cent. glycerol, or with egg yolk citrate buffer, kept at room temperature (+20° C.) or at +2° C., showed full motility and were swirling both immediately after dilution and three hours later. After 24 hours at + 2° C. they showed a very high degree of motility, but only about 50 per cent. of the spermatozoa were motile after the same time at room temperature. At neither temperature did the samples diluted with egg yolk citrate maintain motility better than those containing glycerol.

Samples of bull semen diluted with the varying concentrations of glycerol, plunged into a freezing mixture at −79° C. and thawed after five minutes, showed not more than 10 per cent. motile spermatozoa. In undiluted semen or semen diluted with Wellcome citrate buffer there was no recovery after this treatment. When, on the other hand, bull semen diluted to give final concentrations of 5 per cent., 10 per cent. or 15 per cent. glycerol was cooled slowly from 2° C. to −79° C., and then thawed, the revival was of the order of 50 to 90 per cent. of the spermatozoa, depending upon the method of cooling and the concentration of glycerol. Samples cooled at the rate of 1° C. per min. from 0° C. to −79° C. showed 50 to 60 per cent. revival in 5 per cent. glycerol, and about 70 per cent. revival in 10 per cent. and 15 per cent. glycerol. Another set of tubes cooled in eleven successive stages at 0° C., −2° C., −5° C., −8° C., −10° C., −13° C., −15° C., −20° C., −40° C., −60° C. and −79° C., with five minutes at each temperature, showed similar results. When the stages were shortened to 2½ minutes revival was equally good. Revivals of the order of 90 per cent. were obtained in samples containing 15 per cent. glycerol and cooled in 14 stages of 2½ minutes each, the additional stages being at −30° C., −50° C. and −70° C. Sealed ampoules of bull semen containing 15 per cent. glycerol and cooled in this way showed undiminished motility of the spermatozoa when thawed after ten minutes, two hours and 24 hours at −79° C. After thawing, samples stored at +2° C. or at room temperature showed only a slight reduction in motility

after three hours, but a considerable reduction after 24 hours as compared with controls.

Experiments in which an increasing number of stages of cooling were omitted from either end of the series showed a progressive decrease in the percentage of spermatozoa reviving.

Specimens of goat semen diluted to contain 10 per cent. or 15 per cent. glycerol and cooled from +2° C. to −79 C. in eleven stages, either with 2½ or 5 min. intervals, showed, when thawed, motility as good as the original material. In one case the sample showed swirling motion both before and after freezing.

Two samples of 0·5 c.c. of bull semen were diluted to contain 10 per cent. and 15 per cent. glycerol, cooled slowly to −25° C. and freeze-dried from that temperature for five hours. They were each reconstituted with 0·8 c.c. of distilled water and warmed to +40° C. On microscopical examination of hanging drops from both samples, small numbers of active spermatozoa were seen in each field with the 4 mm. objective.

It must be emphasised that the observations recorded above relate only to the motility of spermatozoa after freezing. Nothing is yet known as to the effect of glycerol diluents or of low temperatures on the fertilising power of mammalian spermatozoa. The effect of low temperatures on the fertilising power of bull spermatozoa will be investigated by S. J. Folley, National Institute for Research in Dairying, Shinfield, in conjunction with D. L. Stewart, of the Reading Cattle Breeding Centre. The interest of the problem lies in the fact that at very low temperatures time loses much of its significance, and if spermatozoa can be taken down to, and revived from −79° C. without destruction of fertilising power, it might be possible to store semen satisfactorily for very long periods.

Acknowledgments.—Our thanks are due to Mr. D. L. Stewart for supplies of bull semen, to Dr. S. J. Folley for the hospitality of his laboratory in the early stages of the work, and to Dr. A. T. Cowie, National Institute for Research in Dairying, Shinfield, for supplies of goat semen. Dr. A. S. Parkes, F.R.S., has given us invaluable support throughout this work.

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I.C.I.—Technical Literature Exhibition.—The exhibition of I.C.I.'s technical literature which the company held, primarily for its own Head Office staff, in London last July, aroused such public interest that it has been decided to re-stage it in larger and more popular form at the Academy Cinema Exhibition Hall, Oxford Street, W.1. (near Oxford Circus) from March 6th to March 17th inclusive, except Sunday. Besides showing visitors a comprehensive selection of I.C.I.'s technical literature for industry and agriculture, the exhibition taking a recent discovery as a model, will trace the production of literature describing the product in question from the original entries in a scientist's laboratory notebook to the printing press. Another exhibit—a selection of technical publications grouped according to the industries for which they are intended—will illustrate the diversity of the interests that I.C.I. serves.

QUARANTINE STANDS ON GUARD IN WAR AGAINST DISEASE

Isolation is Australia's Ally

JOHN LOUGHLIN

It is over 70 years since foot-and-mouth disease appeared in Australia where it was introduced by eight bulls imported from England. It was quickly and ruthlessly stamped out before it had time to spread and has not reappeared.

For its freedom from the ravages of so many of the most destructive diseases of both animals and plants, Australia can thank the natural protection of her geographical situation, and the efficiency of her quarantine.

Until the coming of the first Europeans to settle in 1788, Australia had had no contact with the rest of the world except for the occasional islanders of the East Indies who had visited its northern shores, and it had remained unpolluted by the diseases of the outside world. In any case, Australia had no indigenous animals related to domestic beasts—no native deer, buffalo, goats, pigs, wolves, foxes. It did, however, have a wild dog—the dingo—but the dingo had never been infected with rabies, another disease from which Australia is still free.

The absence of these species of wild animals has an important bearing on the control of diseases among domestic stock. When the pioneer colonists brought the first cattle, sheep, pigs, goats and horses into Australia towards the end of the 18th century, they undoubtedly brought diseases with them. But these died out for lack of hosts after running through the small numbers of domesticated animals, whereas in most other countries the diseases have become established among the wild animals which have remained permanent sources of re-infection.

That is so in Asia and Africa, where foot-and-mouth disease, rinderpest, surra, and blood parasitic diseases allied to surra are established among wild beasts which can touch off new epidemics however effective control measures may be.

Early in Australia's history, before the introduction of an efficient national quarantine system, the long sea voyage from Europe proved a safeguard against the introduction of many diseases. Generally, it covered the incubation period and sometimes whole shipments of stock died before reaching the country.

It is doubtful whether the distance factor would be much of a safeguard to-day, especially as ships call at more foreign ports *en route*. Air transport brings up new problems, but these are met simply by a blanket prohibition of introduction by air of all animals, birds, and insects (with the odd exception of queen bees). Special permits may be given for animals needed for scientific purposes.

Judging from a report by King, an early governor of the colony of New South Wales, foot-and-mouth disease probably existed between 1801 and 1804, but as there were then only 3,000 cattle, 16,000 sheep, 3,000 goats, and 14,000 pigs in the colony, it would soon have worked itself out.

About the same time there were reports of a serious mange parasite disease in sheep—sheep scab. In later years the different State authorities tackled this disease vigorously and it was entirely eradicated before the end of last century—an important triumph for the greatest wool-producing country in the world.

In 1923, rinderpest or cattle plague was introduced into Western Australia through animals of Asian origin

carried on ships for use as fresh food. Although the animals were not landed, it is evident that contaminated material such as manure did get ashore.

Rinderpest is a virulent disease with a high mortality rate and the epidemic was a real danger to the cattle industry, but it was wiped out before it got out of hand. This led to amending legislation forbidding ships from carrying livestock for ship's stores into an Australian port, and a tightening up of control over manure and garbage on overseas ships.

Fear of rabies finding its way into the country is a spectre that haunts Australian quarantine officers if ever they are tempted to relax their strict enforcement of legislation aimed at this dread disease. Only once has it appeared in Australia. That was back in 1867 when a nine-year-old boy died at Hobart, Tasmania, after a dog had bitten him on the lip. Then a pig died from rabies after being bitten by a mad dog. Terrified at the dangers this situation suggested, the town authorities rounded up all stray dogs and destroyed them. That was the end of the rabies outbreak, and there has not been a case since in all Australia.

Quarantine men have to be strong minded to avert the single slip-up in the safeguards against rabies that could undo the success of years of vigilance. As the greatest danger comes from dogs and other pets, they often find themselves involved in emotional conflicts with animal lovers. They had to turn a deaf ear equally to sentimental appeals and charges of stony-hearted officialdom when troops returning from overseas service wanted to land their mascots. Many immigrants plead to be allowed to bring in their beloved pets.

Most ships, too, carry dogs, cats, birds, and even mongooses or tiger cubs, as mascots. A ship's master is under a £50 bond to keep any such animals chained or locked up. At the first port of call, full descriptions of them are taken and circulated to other Australian ports. At each other port, quarantine officers make sure the same animals are still on board and secured. The master is held responsible if they are not.

Among the animal diseases that have somehow or other found their way into Australia with early imported stock and remained to take heavy toll of the livestock industry are tuberculosis, contagious abortion, anthrax, hydatid disease, bovine contagious pleuro-pneumonia, and bovine piroplasmosis.

It is the job of the quarantine organisation to see that no more of them get into the country to complicate disease problems already existing among an animal population of 100,000,000 sheep, 13,000,000 cattle, 1,750,000 horses, 2,000,000 pigs, and vast numbers of poultry.

This is how quarantine works in Australia. Since 1908-09 quarantine has been under Federal control. The Division of Veterinary Hygiene of the Commonwealth Health Department co-ordinates the activities of the livestock divisions in State Departments in external animal quarantine. The principal veterinary officer in each State and the Northern Territory is appointed Chief Quarantine Officer (Animals) and members of his staff as Quarantine officers. This tight and efficient integration of State and Federal organisations places all the resources of state livestock divisions at the disposal of the quarantine organisation. Its effectiveness is ensured by the vital interest of every State in preventing the introduction of disease.

In each State an animal quarantine station is maintained under the control of the Chief Quarantine Officer (Animals). Customs, postal and police department officials all co-operate in quarantine work. Customs boarding officers, the first to board overseas vessels, take the first step in control by finding out what animals and animal products are carried.

Control of import of animals and animal products is based on a general prohibition—with specific exceptions. In deciding on the countries from which import of animals is to be permitted, the quarantine authorities take into account what diseases and livestock control authorities exist there.

Only from the sister dominion of New Zealand, which is particularly free from serious animal diseases of an epizootic nature, is the importation of all kinds of animals allowed.

Other overseas countries from which domestic animals can be imported are: Great Britain, Northern Ireland, Eire, Canada and the United States of America. But not all stock can come even from those countries. For example, horses can be imported only from Great Britain, Northern Ireland, Eire and Fiji ; cattle and sheep can come only from the United Kingdom, Canada, or the United States of America ; swine and goats can be brought only from the United Kingdom.

All animals, with their fodder and bedding, have to be certified by government or government approved veterinarians in the country of origin, as disease-free. In England all cattle, sheep, goats and pigs must spend a fortnight in quarantine before being shipped, as a precaution against the transmission of foot-and-mouth disease. Sheep, which can be carriers of "scab," have to be dipped before export to Australia.

Then, on reaching Australia, animals can be landed only at the capital cities, where they are kept in quarantine for varying periods.

Animal products, too, come under quarantine—hides and skins, hair, bristles, wool, feathers, meat and edible parts of animals, dried blood, animal casings for sausages, bones, animal fertilisers, stock food of animal origin, all of which are capable of carrying disease.

RICHARDSON'S "VETERINARY PROTOZOOLOGY"

Mr. U. F. Richardson, who is at present in South Africa, has written to ask us to insert one or two notes concerning information given in his book on veterinary protozoology, as he thinks that more detailed information and some recent observations on certain subjects would be of interest to veterinary readers.

Theilerial Infections other than East Coast Fever.—A non-pathogenic organism of the *Th. mutans* type has been recorded in Australia (Legg (1935.) *Aust. Vet. J.* **11.** 78), and Dr. Neitz, of Onderstepoort Laboratory, Pretoria, has informed Mr. Richardson verbally that he had been able to confirm the occurrence of an organism resembling *Th. mutans* in blood smears of cattle sent to him by Dr. E. J. Splitter, of Kansas State College, U.S.A. Details of this finding are not yet available in South Africa, but it suggests that the organism occurs in America.

Babesia major.—This name was given by Sergent, *et al.* in 1926, not 1925, to an organism encountered in North Africa in cattle imported from France. They considered this organism was probably identical with the piroplasm previously described from the Baltic and North Sea littora's, where it was said to be associated with sudden death from rupture of the spleen. Inoculated into North African cattle it did not cause serious disease, but Mr. J. L. Stewart informed Mr. Richardson verbally that he had encountered sudden deaths in cattle in the Gold Coast associated with a piroplasm infection which he believed was due to this organism.

Phenanthridinium compounds.—The compound 1553 is now known under the name dimidium bromide.

THE VETERINARY RECORD

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QUARANTINE

THE value of a period of quarantine as a safeguard against the introduction of animal disease is acknowledged by all concerned, and an article which appears in this issue describes the protection obtained in Australia by this means.

Until the era of air travel, animals could be imported into Great Britain by sea alone, and the period of quarantine enforced on animals from other countries has for many years been an important factor in our disease defence measures.

The nature of the conditions necessary for effective protection by this means must be adjusted to the circumstances involved. For instance, the station must be so constructed and conducted that the possibility of the escape of infection is reduced to a minimum, and in the case of highly contagious diseases the station should be at the port of landing. In a disease such as rabies, the separate and secure isolation of each imported dog or cat is the primary factor, and if that is secured the escape of infection from the premises does not present a problem.

The period of incubation and the duration of infectivity of the disease in question governs the length of the quarantine period, but some consideration has also to be given to the possibility that a partial immunity against certain contagious diseases may mask the presence of sub-clinical infection. In such circumstances it may be a necessary precaution to place susceptible animals in contact with the imported animals during the whole of the quarantine period.

Although the living animal is not the only means of introducing animal disease, it constitutes the most likely source, and for that reason unnecessary importation is avoided and where necessary quarantine measures are adopted. If the conditions of quarantine are efficiently adjusted to the circumstances the safeguard can be very valuable. As an example of this, during the last ten years 10,166 dogs and 400 cats were imported and passed through quarantine stations in Great Britain and, of these, nine dogs died of rabies while under detention, each of which cases might have resulted in a widespread outbreak of rabies were it not for the quarantine precautions. The death of the nine dogs proved the existence of a grave danger and the fact that these islands were protected from the introduction of the disease justifies the methods employed.

While properly planned quarantine can provide a valuable safeguard against the introduction of certain contagious diseases, it must nevertheless be recognised that it cannot constitute a complete protection against all such diseases.

Weekly Wisdom

We cannot escape depending on the individual as the ultimate arbiter of taste.—Lord Samuel.

* * * * *

Complaints continue to be received by the Department of Agriculture for Scotland about the worrying of sheep by dogs. The Department would therefore appeal to all dog owners to keep their dogs under proper control, especially when ewes are in lamb and during lambing time. Many sheep and lambs are killed or injured through worrying by dogs and not only is cruelty caused but there is a consequent loss of food.

CLINICAL COMMUNICATIONS

EVEN AREAS OF UTERINE NECROSIS FOLLOWING PARTURITION IN THE BITCH

SIDNEY S. NYE, M.R.C.V.S.,

Romford

The following case is reported for the pathological interest attaching to the condition found on operation.

Subject.—Two-year-old spaniel bitch, primi-gravida.

History.—The bitch gave birth to eight live normal puppies between 4 a.m. and 4 p.m. on August 22nd and cleansed normally after each.

She remained normal up to lunch time of the following day and from then on showed progressive weakness.

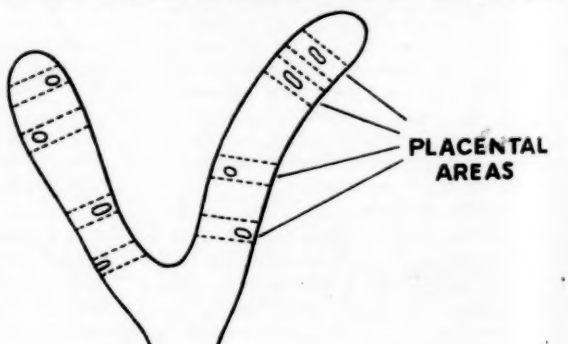
I was consulted at 9 p.m. that evening and found the bitch in a collapsed state, showing abdominal pain. Temperature 105° F.

Diagnosis.—The diagnosis then given was uterine rupture with peritonitis.

Treatment.—Hysterectomy under chloroform anaesthesia was performed at 11 p.m. that night, using midline incision. A little, evil smelling, thin, blood-stained fluid sufficient to ooze from the incision was found in the peritoneal cavity.

On the side of the uterine horns there were found eight elliptical areas of necrosis, 1 inch by 1½ inch in area, two of which were ruptured, the remainder being clearly visible from the serous surface of the uterus.

Each one was situated at the site of placental attachment yet no placental material remained in the uterus.



The peritoneal cavity was irrigated with penicillin solution 0·2 mega of penicillin in about 6 oz. of sterile distilled water, after washing with warm normal saline ; both fluids were inserted by means of a flutter valve with teat syphon attached. The wound was sutured in the usual manner.

Recovery was uneventful.

Since reporting this case we have experienced a similar condition in a Pom which died on admission to the hospital: necrotic areas as described above were found on *post-mortem* examination. Pieces of omentum were adhering to those areas which were ruptured. In my opinion the condition here was not as acute as in the previous case ; complete penetration of the uterine wall, I should say, took place about three to four days *post-partum*.

It was considered that pathological and bacteriological examination would be of no value.

Bovine Teat Surgery

[The following notes are extracted from the minutes of the meeting held by the Southern Counties Veterinary Society at Bournemouth, on October 12th, 1949.]

Mr. T. Norman Gold, M.R.C.V.S., of Redditch, outlined the anatomy of the cow's teat, dealing with the common sites of obstruction to the milk flow, polythelia and polymastia and the removal of supernumerary teats with a Burdizzo Bloodless Castrator. On section and microscopic examination, he had found the so-called teat "peas" to be areas of inflammation containing mastitis organisms. Such areas adhered when the quarter was dry and there was thus no milk to distend the teat cavity. Consequently they were usually found in the freshly calved animal and breaking them down, even under aseptic conditions, liberated the mastitis organisms contained within them, causing an acute quarter. Mr. Gold dealt with both basal and mid-teat obstructions by the use of Hudson's spiral, prognosis depending on the degree of haemorrhage occasioned. In bad cases he liked to treat the mastitis first, endeavouring to get the appropriate drug above the obstruction. After operation he was careful to keep the teat distended by not stripping the quarter completely. Apical obstructions were said to be due to the contraction of scar tissue following injury to the streak canal. Mr. Gold had found Hall's trifin knife better than McClean's double edged blade. He also used the former instrument for the treatment of blackspot, in which he was now having some success with the intravenous injection of sulphamezathine. Great care must be taken after operating on the teat sphincter to milk four times daily—at morning, noon, daytime and last thing at night. The interval between the last and first milking was the most important factor in prognosis.

In the treatment of teat wounds he had found himself with less and less tendency to suture, but injected penicillin or sulphanilamide LSF into the quarter and left it there for 24 hours for even several days, until the acute inflammation had subsided. If he did suture he used a mattress type and covered it with elastoplast over which milking was carried out, preferably by a machine with an old loose liner.

In operating on teat fistulae Mr. Gold emphasised the necessity for inserting the local anaesthetic in the shape of an inverted "V" so that the site was blocked on both sides as well as dorsally. If the opening was direct into the teat sinus the surgeon rotated Hall's knife in it to remove the protruding mucous membrane before closing with a single mattress suture. If it was found by use of a sterile probe that the opening went indirectly through the wall of the teat, he removed a segment the shape of an orange quarter. He left the suture in, covered with elastoplast, for ten to eleven days and filled the quarter with sulphanilamide. For the treatment of apical treads Mr. Gold inserted 1,000,000 units of penicillin and 20 to 40 mls. sulphanilamide L.S.F. and left the quarter alone for 48 to 72 hours until the inflammation had subsided. In no circumstances would he countenance the use of plugs or bougies.

Numerous questions were asked about teat injuries, the use of sulphathiazole in the treatment of blackspot, penicillin as a lubricant for teat instruments, operations for loose sphincters which allowed a cow to run her milk, the injection of spirit for leaking teats and the radical operation for complete teat obstruction.

ABSTRACTS

[Observations on Contagious Pustular Dermatitis of Sheep. Hart, L., Hayston, J. T., & Keast, J. C. (1949.) *Aust. Vet. J.* **25.** 40–45. (7 refs.).]

The authors, after giving some account of the history and economic importance of the disease in Australia, describe laboratory diagnosis by applying suspected scab suspension to the scarified thigh region of susceptible and immune sheep. They state that the uncomplicated lesion is healed 22 to 32 days after infection. Immunised sheep are either fully resistant, or healing occurs in less than 15 days. Duration of immunity was not investigated in detail but seemed to be at least 16 months. Membrane filtrates of porosity 700 mμ, although infective for sheep, would not propagate upon the chorio-allantoic membrane of fertile eggs. Virus was shown capable of surviving for over 15 years at room temperature. Some suspected cases in humans closely associated with affected sheep have been confirmed in the same way as for sheep. A method of immunising sheep is described and attention is drawn to the danger of immunising ewes at such a stage of pregnancy that their lambs may be born before the vaccine lesion has healed.

A. W. G.

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[A Case of Orf (Contagious Pustular Dermatitis) : Identification of the Virus. Blakemore, F., Abdussalam, M., & Goldsmith, W. N. (1948.) *Brit. J. Derm. & Syph.* **60.** 404–409. (16 refs.).]

The authors describe a human infection which developed about a week after contact with infected sheep and lasted about seven weeks. Scab extract from the lesion produced typical C.P.D. in a normal lamb, yet not in a lamb immunised against a known strain of C.P.D. Elementary bodies from lambs infected with the human virus appeared identical with those of C.P.D. when examined by the electron microscope and by the ordinary microscope using stained preparations. Serum from a recovered patient agglutinated suspension of e.b.s. whereas none of the normal human sera tested did so. A man, infected experimentally with C.P.D., developed the disease which lasted for 17 days. Subsequent infection of the same individual caused a local reaction which may have been allergic. Scabs from this case produced the disease in a lamb, and convalescent serum agglutinated a suspension of e.b.s. It is suggested that the agglutination test might be of value in diagnosis.

A. W. G.

Trivia

"Fifty Years Ago"

Pills and horse balls were made by hand, and no heat was permitted. The usual batch was 2 to 2½ lb., made on a hand machine, and there were blistered hands if interruptions caused the mass to harden. There was plenty of dispensing, and compounding of veterinary medicines. Horsekeepers would wait at the rear until all counter space was unoccupied, then advance with an air of mystery, and produce from a waistcoat pocket, with much fumbling, a tattered piece of paper. On this would be inscribed black antimony, black sulphur, resin, gentian, aniseed and foenugreeck, in proportions that differed little in each case. Once I ventured to enquire of such a customer if he needed horse powder, and received the crushing rebuke that I should have more sense than to ask such a silly question when the moon was on the wane!—"Saxon" in *The Pharmaceutical Journal.*

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Cry in the Night

From time to time you voice the grievances of doctors towards some of their patients, and rightly so, for we have at times much to contend with. Have I not myself, on at least two occasions, been summoned in the night merely to keep the baby quiet so that the rest of the family might have their due meed of sleep. "It's your job, ain't it? I got to go to work in the morning, see." And there we have it in a nutshell. Everybody, it appears, goes to work in the morning except the doctor, who presumably lies abed until the day is well aired.—A correspondent in *The British Medical Journal.*

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The Tail Piece

Two youths in civilian clothes who called at Whipsnade zoo asked for "hairs from the tail of the zoo's largest giraffe." Their request was granted. One of them told the superintendent, Mr. E. H. Tong, that he was in the Army, and was taking part in an exercise entitled "lunatics at large." He produced what was apparently a stereotyped army form containing a list of place names, which included Whipsnade, and the instructions relating to the giraffe hairs. A successful mission would earn him 15 marks.

NATIONAL VETERINARY MEDICAL ASSOCIATION

Annual Congress, Cardiff, 1950

PROVISIONAL PROGRAMME

All Papers will be presented and discussed at the Technical College, Cardiff.

SUNDAY, SEPTEMBER 3RD

7.00 p.m. "At Home" in the Whitehall Rooms, Park Hotel, given by the South Wales Division, N.V.M.A.

MONDAY, SEPTEMBER 4TH

10.30 a.m. Civic welcome by the Lord Mayor of Cardiff in the Cardiff Technical College.

11.00 a.m. Official opening of the Trades Exhibition in the Technical College.

11.15 a.m. Paper: "Factors Influencing Herd Fertility in Cattle." Writer: S. L. Hignett (Frant). Openers: D. W. Deas (Lasswade); J. Smith (Carmarthen).

2.00 p.m. Ladies' pleasure trip to Porthcawl, returning at about 5 p.m.

3.00 p.m. Film Show at the Technical College.

7.30 p.m. Civic Reception at Assembly Room, City Hall.

TUESDAY, SEPTEMBER 5TH

10.00 a.m. Paper: "Clinical Diagnosis of Diseases of the Abdomen in the Dog and Cat." Writer: J. S. J. Lauder (Hale Barns). Openers: Miss O. D. James (Cardiff); J. W. Heney (Dublin).

11.00 a.m. Ladies' pleasure trip to the Wye Valley, returning about 4.30 p.m.

11.30 a.m. Paper: "The More Obscure Diseases of the Pig." Writers: H. G. Lamont and D. Luke (Belfast). Openers: P. L. Shanks (Leeds); J. F. Timoney (Dublin).

2.00 p.m. Surgical and other demonstrations at Whitchurch Mental Hospital Farm:—
1. Soundness in the Heavy and Light Horse.
2. Modern Methods of Anaesthesia in Animals (*a*) Local, (*b*) General, in the Bovine, Equine and Small Animals.

5.00 p.m. N.V.M.A. Council Meeting in the Council Chamber, City Hall.

7.30 p.m. Annual Banquet in the Assembly Room, City Hall.

WEDNESDAY, SEPTEMBER 6TH

10.30 a.m. Paper: "Deficiency Diseases, particularly Acetonaemia." Writer: Dr. Carlstrom (Sweden). Openers: R. H. Smythe (Nottingham); J. R. Holmes (Liverpool University Veterinary Field Station).

2.30 p.m. Congress Photograph on the steps of the Museum.

3.00 p.m. N.V.M.A. Annual General Meeting at the Technical College.

7.30 p.m. President's Reception at the Country Club, St. Mellon's.

THURSDAY, SEPTEMBER 7TH

10.00 a.m. Paper: "Symposium on Sheep Diseases." Writers: S. Jamieson (Aberdeen); L. E. Hughes (Aberystwyth); W. T. Rowlands (Bangor); J. T. Stamp (Edinburgh). Openers: D. E. Davies (Cornwall); D. R. Allen (Cardiff).

11.45 a.m. Sectional Meetings.

Afternoon. (*a*) Bowls Competition at the invitation of the Barry Athletic Club. (Organiser: R. W. Hall, Barry.) Tea at the Merrie Friars Café, Barry, at the invitation of the President, South Wales Division—R. W. Hall.
(*b*) Golf Competition at the Penylan Golf Club. (Organiser: C. J. Pugh, Newport.)

8.00 p.m. Ladies' Guild Dance. Venue to be arranged.

FRIDAY, SEPTEMBER 8TH

10.00 a.m. Paper: "Diseases of the Ruminant Stomach." Writer: H. Begg (Strathaven). Openers: A. T. Morgan (Carmarthen); D. G. E. Davies (Llandyssul).

11.30 a.m. Paper: "S.19 and the Control of Brucellosis." Writer: J. R. Lawson (Weybridge). Openers: A. J. Wright (Macclesfield); and another.

2.30 p.m. Closing Meeting of the Congress at Cardiff Technical College.
Council Meeting N.V.M.A. at Cardiff Technical College.

N.V.M.A. CONGRESS AT CARDIFF

Hotel Accommodation

We are advised that hotel accommodation available in Cardiff at the time of the N.V.M.A. Congress (September 3rd to 8th inclusive) is limited.

Members are urged, therefore, to book their rooms as early as possible, and to facilitate this we reproduce below particulars of such block reservations as the Provisional Committee has been able to make. They are asked to note specially :—

1. That these particular reservations are contingent on applications being received from members at least two months prior to the opening of the Congress ;
2. That applications should be made direct to the hotel concerned and *not* to the Local Secretary ; and
3. That, in making application, members should mention the fact that they are veterinary surgeons attending the Congress.

	Block Reservations			(*All nett charges*)		
	Single Rooms	*Twin-Bedded Rooms*	*Double-Bed Rooms*	*Bed and Breakfast (Single)*	*Bed and Breakfast (Double)*	*Board Per Day*
Angel Hotel, Westgate Street, Cardiff... ...	10	6	5	19/6	39/–	30/6
Alexandra Hotel, Queen Street, Cardiff ...	—	4	2	14/6	29/–	23/–
Queen's Hotel, St. Mary Street, Cardiff ...	2	11	8	16/6	33/–	24/6
Barry's Hotel, St. Mary Street, Cardiff ...	10	5	10	16/6	32/–	25/–
Sandringham Hotel, St. Mary Street, Cardiff...	12	6	3	15/–	30/–	23/–
Park Hotel, Park Place, Cardiff (Headquarters Hotel)	30	16	12	16/6	33/–	25/6
Marine Hotel, Barry Island	—	2	2	14/6	29/–	21/–
Barry Hotel, Barry	3	3	3	14/6	29/–	24/-
Esplanade Hotel, Penarth	6	6	6	15/6	31/–	25/6
	73	59	51			

ADDITIONAL HOTELS WITHOUT RESERVATIONS

We have also been furnished with the following list of additional hotels to which applications for accommodation also can be made. Here, again, the necessity for early application is stressed.

Railway Station Hotel, Station Approach, Cardiff.

Philharmonic Hotel, St. Mary Street, Cardiff.

Gwalia Hotel, Barry.

Ship Hotel, Barry.

Seafield Hotel, 14, The Parade, Barry.

PRIVATE HOTELS

"Cedars," Fidlas Road, Cardiff.
"Ashburton," 227, Newport Road, Cardiff.
Mrs. Kennett, 60, Park Place, Cardiff.
Mrs. Cleves, 8, Tydraw Road, Cardiff.
Hamilton Guest House, 82, Penylan Road, Cardiff.
Mrs. Hesbronder, 233, Allensbank Road, Cardiff.
St. David's Hotel, 103, Newport Road, Cardiff.
Mrs. Woodward, 193, Newport Road, Cardiff.
Mr. Begg, 36, Hamilton Street, Cardiff.
Mrs. Springett, 26, Column Road, Cardiff.
Lyndon Court Hotel, 191, Newport Road, Cardiff.

QUARTERLY MEETING OF COUNCIL, N.V.M.A.

Summary of Proceedings

Contrasting strongly with the prevalent external atmosphere of electoral controversy, unity of approval on the conduct of association business facilitated the process of dealing with the agenda at the meeting of the Council of the National Veterinary Medical Association held at the Connaught Rooms, W.C.1, on Friday, February 10th, 1950, with the President, Mr. J. W. Bruford, in the chair.

Council met under the shadow of sadness thrown by the death of Mr. Arthur Gofton, one to whom the Association owes a great debt of gratitude for the exercise of his abilities, in conjunction with the late Dr. Bradley, in so re-organising its structure that development into the all-embracing federation of veterinary societies that the "National" is to-day became assured. Moving tribute was paid by representatives from North and South of the Border to this momentous application of his talents and personality and also to that further outstanding product of his pioneering spirit, his contribution to the advancement of veterinary public health, in his capacity as Chief Veterinary Officer to the City of Edinburgh.

Arising from the deeply-regretted appearance on the list of resignations from membership, of some who had rendered a lifetime of valued support to the Association, it was unanimously resolved that the General Purposes and Finance Committee should consider the institution of some honorary category which should ensure the retention of all such members.

Intimation of the pending departure (to take up a journalistic appointment) of Mr. Geoffrey West who has served the Association as Liaison Secretary—as the post is now known—for two and a-half years, evoked from the President, from Dr. Wooldridge (Chairman of the Parliamentary and Public Relations Committee) and indeed from all quarters, expressions of deep regret and of keen appreciation of his work. It is only a half truth that no one is irreplaceable, for something of real value is lost when any long-term activity is relinquished by competent hands. That the office is now regarded as indispensable, Council accepting without question that these activities must continue, is the true measure of Mr. West's success in an appointment which at its initiation was, as some of his admirers confessed, regarded even by them as unlikely to lead to such an outcome.

The impact upon the Association of the establishment of a Supplementary Register (of Veterinary Practitioners) was reflected in a decision that the officers should consult with the Association's solicitors, and report back to the General Purposes and Finance Committee, on communications regarding (1) membership of the N.V.M.A. of persons placed on that Register, and (2) application of a body representing such persons to, or acceptance of its members by the "National." Conditions were laid down governing the acceptance by *The Veterinary Record* of advertisements from registered veterinary practitioners.

After some discussion, Council approved the method of payment of expenses of representatives of Divisions serving on the Council and Committees of the Association made in the report of a sub-committee of the General Purposes and Finance Committee, which proposals are now to be referred to Divisions for their acceptance. When this issue is settled, further consideration will be given to the question of reviewing the basis of representation of Divisions on Council, N.V.M.A.

From the report of this committee it was learned with satisfaction that the Ministry of Agriculture had agreed to the modifications suggested by the Association to the arrangements for implementing the revised Calfhood Vaccination scheme. The effect of the main modifications is two-fold: (1) that an assistant, not being a Local Veterinary Inspector, can carry out vaccination in tuberculin tested and attested herds, and (2) that such vaccination need not now be done at the time of testing.

In a reply received from the Ministry of Agriculture, information was given to the effect that a draft order providing for control of the manufacture of veterinary therapeutic substances and prescribing standards and tests of purity, is almost ready for circulation to representatives of the interests concerned, for their comments.

In connection with the proposed Hospital Scheme of the Animal Health Trust, the Organising Committee's expression of the wish to see an agreed report of the first meeting between representatives of that committee and of the Trust was welcomed by Dr. Wooldridge, the Scientific Director, who averred that it would reveal, *inter alia*, that the Trust would not for one moment consider setting up hospital centres without full agreement with both the N.V.M.A. and the local practitioners concerned.

The Home Appointments Committee requested the Officers to consult with the Royal College in an endeavour to clarify the position under the Veterinary Surgeons Act, 1948, of students employed in practice.

The Veterinary State Medicine Committee reported that the B.M.A. and N.V.M.A. Joint Committee will be presenting a memorandum of evidence to the Interdepartmental Committee on Meat Inspection, and that satisfactory progress is being made in its preparation. The conditions under which livestock are conveyed by rail have been under discussion with British Railways, whose Executive appear anxious to improve their arrangements and to meet the views of the profession, but express themselves as being handicapped in doing so at present by economic and other considerations. Further meetings are to be held at which the Association's representatives will lay special emphasis upon the conditions of transport of calves over long distances.

Important recommendations relating to the functioning of Artificial Insemination Centres from the veterinary viewpoint were made in the report of the Sub-committee appointed to enquire into this matter. Divisions are to be invited to consider the recommendation that there should be periodic meetings between local veterinary surgeons and the veterinary officer of the nearest centre, arranged by the latter, as a means of facilitating the direct passage of information: discussions on a wider basis and with broader representation to the committee, also are to be arranged. Enquiry is to be made of the Livestock Division of the Ministry of Agriculture as to how far it has been possible to implement the understanding that veterinary surgeons be appointed to all cattle breeding centres at which bulls are kept. The Livestock Division is also to be informed that the Association is still convinced that the Ministry's policy in respect of the conditions governing the inspection of stallions for licensing purposes should be reconsidered, for the reasons already placed before it.

The Editorial Committee has decided that, as now permitted by Council, R.C.V.S., the Association should, in future, send its own reporter to all "open" sections of meetings of that body. It was also agreed to proceed with the publication of a pictorial souvenir of the XIVth International and LXVIIth N.V.M.A. Congresses, initially as a limited issue of 1,500 copies, 1,000 of which should be available for free distribution to members on application.

In this issue we reproduce the Provisional Programme of the Annual Congress of the Association to be held at Cardiff from September 3rd to 8th, but the full report of the expeditious activities of the Provisional Committee, of which the programme forms a part, will be well worth careful perusal when it appears in the detailed report of the proceedings of Council shortly to be issued in our next supplement. The committee were congratulated on the excellent progress made, on the comprehensiveness of the papers and on other features of what is now taking shape as a meeting with a wealth of well-balanced attractions.

DEATH OF GIANT PANDA

Lien-ho, the London Zoo's giant panda, died in the Zoological Gardens on Wednesday of last week. It had been ill since before Christmas, and then fell a victim to pneumonia. The animal had been in the gardens since May, 1946, when it was believed that it was 18 months old; also (erroneously) that it was a female.

Lien-ho was found, after great difficulty, in the mountains of western Szechwan, China. The Zoo authorities do not think that, under present conditions, another expedition to western China would be permitted by the present Chinese Government.

NOTES AND NEWS

Diary of Events

Mar. 8th.—Meeting of the Editorial Committee, N.V.M.A., 3 p.m.; meeting of the Editorial Executive Committee, 1.30 p.m.

Mar. 8th.—Meeting of the Society of Women Veterinary Surgeons at Liverpool (The Veterinary Hospital, Pembroke Gardens), 6 p.m.

Mar. 9th.—Annual Meeting of the South Eastern Division, N.V.M.A., at Maidstone (Royal Star Hotel), 2.30 p.m.

Mar. 14th.—Meeting of the East Midlands Division, N.V.M.A., at Sutton Bonington, 2 p.m.

Mar. 15th.—Meeting of the Royal Microscopical Society in the Hastings Hall, B.M.A. House, Tavistock Square, W.C.1, at 5.30 p.m.: Dr. G. H. Bourne (The London Hospital), "Golgi apparatus and Mitochondria and their significance in cellular physiology."

Mar. 15th.—Meeting of the North Wales Division, N.V.M.A., at Bangor (School of Agriculture, Deiniol Road), 2 p.m.

Mar. 16th.—Meeting of the Herts and Beds Division, N.V.M.A., at Luton, Beds (The George Hotel), 7.30 p.m.

Mar. 22nd.—Meeting of the Technical Development Committee, N.V.M.A., at 36, Gordon Square, W.C.1, 10.30 a.m.

Mar. 23rd.—Annual Meeting of the Western Counties Division, N.V.M.A., at Exeter (The Rougemont Hotel), 2.15 p.m., to be preceded by Annual Luncheon (1 p.m.) and Meeting of Council (11.30 a.m.).

Mar. 24th.—Annual Meeting of the Biochemical Society, in the Department of Biochemistry, University College, Gower Street, W.C.1, 11.30 a.m. (Papers will be read and demonstrations given.)

Mar. 29th.—Meeting of the Association of Veterinary Teachers and Research Workers (Northern Region), at Messrs. Boots Veterinary Science Division, The Priory, Thurgarton, Notts, 12.30 p.m.

Apr. 14th.—Dinner Dance to be held by the Yorkshire Division, N.V.M.A., at Leeds (Guildford Hotel), 7.15 for 7.30 p.m.

N.V.M.A. Council and Committees

The next Council and Committee Meetings of the Association will be held at the Royal (Dick) Veterinary College, Edinburgh, on April 26th, 27th and 28th.

The time-table is as follows:—

Wednesday, April 26th.

11 *a.m.* Veterinary State Medicine Committee.
2.30 *p.m.* Organising Committee.

Thursday, April 27th.

10 *a.m.* Home Appointments Committee.
11.30 *a.m.* Parliamentary and Public Relations Committee.
2 *p.m.* General Purposes and Finance Committee.

Friday, April 28th

11 *a.m.* Council Meeting.

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Collection of Accurate Data on the Incidence of Disease

This project has been received with some enthusiasm by those who have volunteered to help and it appears that many farmers have shown great interest and are very willing to co-operate. Only about 50 veterinary surgeons, however, are so far putting the project into practice and very many more volunteers are required. Any member, therefore, who would like more particulars is asked to write to the General Secretary, N.V.M.A., 36, Gordon Square, London, W.C.1.

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The Husbandry and Diseases of Goats

Issue of Handbook by the N.V.M.A.

As its Publication No. 18, the National Veterinary Medical Association has now issued a handbook, "The Husbandry and Diseases of Goats," this being Section VI of its Report on the Diseases of Farm Livestock. This publication, which has been prepared by the Technical Development Committee of the Association, is in process of distribution to members, N.V.M.A., and any such who fail to receive their copy within the next fortnight are requested to advise the General Secretary at 36, Gordon Square, London, W.C.1. Others (including students) requiring copies are asked to await announcement of price which shortly will be made in these columns.

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Royal Veterinary College and Hospital

Admission as a School of the University of London

We are informed that the Royal Veterinary College and Hospital has been admitted as a School of the University of London, in the Faculty of Medicine, as from October 1st, 1949.

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"Veterinary Surgeon" on Motor-cars

In case the announcement in our issue of last week may have escaped the attention of some readers, we repeat the following warning information recently received from the Royal College:—

Enquiries have been received by the Royal College of Veterinary Surgeons as to whether it is permissible for a veterinary surgeon or a person registered on the Supplementary Veterinary Register to use the title "Veterinary Surgeon" or "Veterinary Practitioner" on the windscreen of a motor-car.

The position is that for a certain period this was permitted, but the Council of the Royal College of Veterinary Surgeons has laid down that the use of such titles on the windscreen or anywhere else on a motor-car is now no longer necessary, and must not be used as they are of the essence of advertising.

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The Coal Mines (Horses) General Regulations, 1949

These regulations were made and laid before Parliament in December, 1949, and came into force on January 1st of this year. They modify the third schedule to the Coal Mines Act of 1911—the former relating to the care and treatment of horses and other animals in mines.

The new regulations add the following provisions to the first regulation of the Act:—

"(2) Every horse shall be examined once at least in every 12 months by a duly qualified veterinary surgeon; and a report of each such examination (including a certificate of the fitness or unfitness of the horse for work or for work in the mine) shall be recorded in the book to be kept by the horsekeeper in pursuance of regulation 13 and shall be signed by the veterinary surgeon.

(3) Any horse certified as aforesaid to be permanently unfit for work or for work in the mine shall as soon as practicable be brought to the surface.

(4) No horse certified as aforesaid to be unfit for work shall be disposed of alive otherwise than for immediate destruction or to a home of rest maintained for the reception of animals not then fitted for work or to a responsible person not carrying on the business of dealing in horses."

Regulation 3 requires each pit pony to be housed in a stall adequate for its size and provided with suitable bedding. Regulations 4 and 5 make detailed provisions concerning stables, and the precautions to be taken against contamination by dust, etc., of the animals' food and water.

Limitations on the number of shifts which may be worked are prescribed (Reg. 6). A pony is to be fed and watered by its driver in any shift exceeding four hours, and must not be left unattended unless properly secured (Reg. 7). The driver is to report any matter affecting its care or treatment not only to the official under whose direction he works but also to the horsekeeper responsible for the animal (Reg. 8). Records to be kept under the Coal Mines Act, 1911, are to include certain additional matters (Regs. 9 and 10).

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PERSONAL

Birth.—Fletcher.—On February 23rd, 1950, at 24, St. Gildas Road, Cardiff, to Elsie, wife of J. T. Fletcher, a son—John Coulthwaite.

Marriage.—Prescott—Sleigh.—At Rubislaw Church, Aberdeen, on February 24th, 1950, John Graham Prescott, B.Sc. (Edin.), M.R.C.V.S., elder son of Mr. and Mrs. J. Prescott, Hyde, Cheshire, to Annie Kilpatrick Sleigh, R.G.N., elder daughter of Mr. and Mrs. A. Sleigh, Tarves, Aberdeenshire.

The best man was G. S. R. Malone, B.Sc., (Edin.)., M.R.C.V.S.

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ROYAL (DICK) VETERINARY COLLEGE ALUMNUS ASSOCIATION

Annual Dinner of the Hong Kong Branch

The Annual Dinner of the Royal (Dick) Veterinary College Alumnus Association (Hong Kong Branch) was held in Sassoon Villa, Hong Kong, the residence of Mr. H. C. Watson, on February 9th, 1950.

The following distinguished members attended:—G. Hamilton Dick, J. Allan Auchnie, C. Newby Chapell, Rognvald H. Robertson, A. Gairdner Ralston and H. Cameron Watson.

Tribute was paid to the memory of the late Dr. O. Charnock Bradley and a toast drunk to the "Dick," coupled with the name of Principal W. M. Mitchell.

Later in the evening toasts were proposed and drunk to G. Greensit Alton, D. Lepraik McWhirter (members *in absentia*), Symon Sharp, Duncan, Joe Peapell, Joe Ritchie, Mrs. MacLay and many others.

An enjoyable evening came to an end when Lt.-Col. Ralston, in the much-regretted but unavoidable absence of his brother-in-law (Professor Mitchell), gave a masterly rendering of "Cock Robin."

H. C. W.

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LEGAL NOTES

"Homesickness" in the Bull.—Judgment for £120 15s., the price paid, was given by His Honour Judge Tenwick at Penrith County Court when Sir Gilbert McIlquham, Staverton House, near Cheltenham, sued C. Hetherington & Son, Holme Head, Penrith, for breach of warranty in the sale of a pedigree Shorthorn bull, Bellmount Wild Mint.

In its report of the case *The Farmer's Weekly* records that the bull was bought for plaintiff at one of the sales of the Penrith Association of Shorthorn Breeders by Mr. Wm. Nixon, Claverton, Warwick. It is a condition of the Association's sales that all bulls 12 months and over are sold as capable of getting stock. For plaintiff it was contended that the bull was ineffective when tried at Cheltenham and was, therefore, returned. For the defence, it was contended the bull was effective when it was returned, and, therefore, the vendors resisted the claim and counter-claimed for £22 19s. 6d. for the bull's keep.

Mr. Nixon, in evidence, was asked how a bull could be effective at Penrith and yet ineffective at Cheltenham. He replied that it could be affected by environment, different handling, etc. For the defence, Edwin Hetherington said the bull was formerly sold at 14 months, but was taken back because of a complaint it did not serve. It was then used with success and so was sold at the sale as correct. After it was returned from Cheltenham, it was tried successfully and cows on the farm were in calf to it.

Mr. Maurice McMillan, veterinary surgeon, Penrith, said he examined the bull when it was returned from Cheltenham. It was perfectly healthy, and he saw it serve a cow.

Giving judgment, His Honour said that the case was peculiar because, broadly speaking, he could accept substantially the evidence on both sides. It was quite clear that while the bull was running about in its home pastures or was in its home buildings, it functioned satisfactorily, but that it did not do so when it went to Gloucestershire. "I find that that is not inconsistent with this bull being one of a very small number of bulls which have a psychological or temperamental weakness. It might well be described as homesickness."

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MILK TEST CHANGE: NEW RULES FOR REPEAT SAMPLES

The routine testing of all designated milk is modified as from after Wednesday, March 1st. In agreement with the Ministry of Agriculture the joint committee for the Control of Milk Quality has made the following amendments to the order which came into operation last October:—

If the monthly sample taken by the dairy fails the methylene blue test the dairy will notify the producer but not the Ministry. Within ten days the dairy will take a repeat sample and if this is satisfactory no further action will be taken.

If the repeat sample fails both the Ministry and the producer will be notified and the Ministry's officers will proceed to take an official sample at the farm.

These amendments show that all designated milk will come under test, but Ministry officials will not take action unless the "repeat" samples are unsatisfactory.

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RECORD JANUARY MILK OUTPUT

The Milk Marketing Board has announced that 132 million gallons of milk were sold off farms in England and Wales in January. This is 16 million gallons more than the record output of January, 1949, and 53 million gallons more than in January, 1939.

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THE TOXICITY OF IRON SALTS AND BORIC ACID IN THE HUMAN SUBJECT

It is probably true to say that iron salts are very seldom thought of in connection with poisoning. Lander's Toxicology (3rd edition, revised by Nicholson)—apart from a passing reference to sulphate of iron causing purging, etc., in the human subject, and of a cow being killed in 1893 by iron perchloride—states: "absorption from the intestines is so slight and so slow that poisoning does not arise when iron is given by the mouth." It may be of interest, therefore, to refer to fatal iron poisoning in the human subject. Several deaths from this cause among children have been recorded, and last year a case* was described in which there was distinct evidence of corrosive action, exerted on the gastric mucosa, by the ferrous sulphate content (aa grs. iii) of an unknown number of pills which an eleven-months' child had swallowed. Drowsiness and vomiting were followed by a misleading period of improvement (apparently characteristic of acute iron poisoning), which in turn was rapidly followed by death.

More recently (February 4th, 1950) the *British Medical Journal* referred to the death of an adult woman who had taken ½ oz. of iron and ammonium citrate, the official maximum dose being 40 gr. Death was ascribed to hepatitis due to iron poisoning.

"The citrate in iron and ammonium citrate serves as a buffer, so that this preparation occupies an intermediate position between ferrous sulphate and ferrous carbonate. The risk of poisoning is less than with the sulphate, but the absorption of iron, and therefore the efficiency, is also less. Any danger that exists depends on susceptibility and dose. Preparations of iron are not scheduled poisons, but the recent fatalities will no doubt put practitioners on their guard, especially in prescribing iron for children." The recommended antidote is alkali to form insoluble hydroxides.

Boric Acid

Attention was drawn to the toxicity of boric acid in *The Veterinary Record* for January 5th, 1946, but Lander's Toxicology (3rd edition) makes no reference to this substance which, in the words of the *Lancet* (February 4th, 1950), is usually regarded merely "as a mild, bland antiseptic, and there is hardly a part of the body to which it has not been applied. That it is toxic when taken by mouth is fairly well known, though even this was not appreciated by 20 out of 30 doctors who were questioned. Its toxicity from external application is less widely known, though severe poisoning and deaths have resulted from its employment in this way. According to Ross and Conway, the first fatality was reported in 1883, when a man died from five days' application of boric-acid powder to a sore on the leg. Other deaths have been due to irrigation of septic cavities, administration in enemas, and application as a burn dressing and in the treatment of widespread eczema, to mention only a few instances. Accidental ingestion—for example, by mistake for a saline purgative—has been reported from time to time, and in one baby death was due to borax and honey given for thrush. At least one breast-fed infant has died as a result of boric acid being used to cleanse the mother's nipples, and in an epidemic of diarrhoea in a neonatal ward the evidence strongly suggested that the infecting organisms were conveyed to the infants by the pledgets of cotton-wool soaked in boric-acid solution used for cleansing the nipples of the nursing mothers. It is among infants that the death-roll has been highest. Ross and Conway traced 20 deaths up to 1943, since when a further 12 have been recorded; and about half of these deaths—to which others could be added—have been of children under the age of two years. The most recent report concerns a tragic accident in hospital, when six babies, aged six to eleven days, died because a 2·5 per cent. aqueous solution of boric acid was used in place of sterile water in preparing feeds. The infants died between 19 hours and 3½ days after a single feed prepared in this way; the fatal dose was thought to have been less than 3 g. The lethal dose seems usually to be 5 to 6 g. in children and 15 to 20 g. in adults, but wide variations are recorded; one woman, for example, showed only mild toxic effects when given 15 g. intravenously. Repeated

doses, by whatever route, have a cumulative effect—a fact which has led to the banning of boric acid as a food preservative.

"The main signs and symptoms of poisoning are those of gastro-intestinal irritation—nausea, vomiting, epigastric pain, and diarrhoea—accompanied by increasing shock and ultimately collapse. Convulsions have been reported. There is an erythematous rash, which may be very pronounced, and which is followed by desquamation. Death may take place up to five days after a fatal dose. Treatment, according to Pfeiffer and others, consists in administering intravenously large doses of saline and plasma. *Post mortem* the usual findings are inflammation of the alimentary tract, toxic degenerative changes in the liver and kidneys, and cerebral oedema. Boric acid is concentrated most highly in the brain and liver."

Mention is made of the fact that, while boric acid and sodium borate have some bacteriostatic action, *Staphylococcus aureus* survives long exposure to a saturated solution of the former. Accordingly, "When a drug can be shown to be almost entirely ineffective and at the same time dangerous, even when used in ordinary ways, it is time to remove that drug from general use as rapidly as possible."

It is possible that the foregoing may have some significance in veterinary practice also among young animals.

G. P. W.

* Prain, J. H. (1949.) *B.M.J.* **2**. 1019.

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IMPORTANCE OF THE HEAVY HORSE

At the recent annual general meeting of the British Horse Society Colonel G. H. B. de Chair gave a warning that the time might come when the existence of the heavy horse might be vital to agriculture. Colonel de Chair said they wanted it to be known how interested the British Horse Society was in the heavy horse. There were those who believed that the time was coming when people would realise its importance.

The President's report revealed that the Race Course Betting Control Board had contributed £2 000 towards the work of the joint Heavy Horse Committee to encourage and maintain the use of the horse for agriculture. There have been several meetings between representatives of the heavy horse societies and the Ministry of Agriculture, and various schemes and ideas are being investigated.

During a discussion on rations for horses, Colonel de Chair suggested this was a good time to press for rations for all horses, because many farmers had told him they could not use all the cereal coupons issued. Another speaker said they should press rather for the derationing of all cereals.

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HORSE DECLINE "COURTS DISASTER"

The Clydesdale Horse Society of Great Britain, in its 73rd annual report, records its emphatic opinion that to allow Britain's horse population to fall further would be to court disaster. "Entire reliance on mechanised power is neither in the interests of agriculture nor of the nation."

The report lists points in which, it is said, the horse has the advantage over the tractor. "Oil-driven machines give nothing back to the land to maintain fertility, they necessitate heavy capital expenditure, are costly to keep up and require renewing at fairly frequent intervals. The horse is maintained entirely on home-produced foods, breeds his own replacements and appreciates in value for some years after he has been put to work.

"In addition, he does not leave behind him broken drains but, instead, something of great value in maintaining and increasing the productivity of the land. Also, cultivations carried out by horse labour are certainly in no way inferior to those carried out by tractor power, and in the opinion of many agriculturists horse cultivations are much superior."

On the slaughter of horses, the report says the number going for food has fallen off considerably in the past few months.

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Erratum.—In Mr. Steele-Bodger's reply to discussion of his address on "Book-keeping and accountancy in relation to a veterinary practice," published in our last issue (col. 1, page 107), *for* 50 *read* 5d. in the following sentence: "It is possible to arrange with the G.P.O. for details of all charges over 50 to be furnished with the telephone account, and this enables practitioners to recoup themselves, at least for the cost of telephone consultations."

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A hen belonging to Mr. E. Jackson, of Willaston, Cheshire, laid an egg weighing 6¼ oz. When it was opened another egg, complete with shell, was found inside.

ADDRESSES OF DISEASE-INFECTED PREMISES

The list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

Foot-and-Mouth Disease:

Essex.—Brookmead Farm, New Hall Lane, Mundon (February 23rd).

Kent.—Oakwell Farm, Blean, Canterbury (February 23rd).

Sheep Scab:

Cumberland.—Blackburn Banks, Alston (February 14th), and Ghyll House, Alston (February 15th); Lazonby, Penrith (February 20th).

Lancashire.—Trawden Forest, Colne (February 16th).

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B.M.A. Annual Meeting.—This year's annual conference of the British Medical Association will be held at Liverpool and Southport from July 13th to July 21st. The Medical Exhibition will open on July 18th in St. George's Hall.

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the N.V.M.A.

MR. J. E. JOHNSON'S CASE AND ANIMAL BEHAVIOUR

Sir,—Students of animal behaviour recognise what have been termed "Displacement Reactions." Thorpe (1948) defines a displacement reaction as "an irrelevant movement occurring when an animal is under the influence of a powerful urge, but is at the same time in some way prevented from expressing its urge in the appropriate way." Tinbergen (1942) uses the term "substitute activities" for such behaviour. Bierens de Haan (1946) describes displacement reactions as occurring: "If, for some reason, the normal issue of an instinctive activity is interrupted, the energy, set free by the drive, may 'spark over' to another movement mechanism and so seemingly evoke another instinct, for which there is no motive at that moment."

Now it could be deduced that in Mr. Johnson's case (1950) the horse was under a powerful urge, namely, to get rid of pain or, more fundamentally, to get rid of the abnormal lesions and return to a state of normality and that, being unable to do so, it resorted to displacement or substitute activities. In the first place the horse showed pawing with the fore foot. (Such behaviour is commonly seen in horses when eagerly awaiting food or when under restraint, as, for example, before a race, and may well be a displacement reaction in the normal animal.) In the second place this animal often adopted the position for staling, and in the third place, "when made to stand, the horse continually rubbed its tail against the wall with a definite side to side movement." Thus we have in Mr. Johnson's case the exhibition of three behaviour patterns all belonging to what are normally drives quite irrelevant to the disease process involved, namely (i) pawing, (ii) the adoption of the posture normally associated with micturition, and (iii) rubbing normally associated with itch.

I have personally seen a horse affected with grass sickness bite vigorously at its thigh region under circumstances which did not at all suggest itch caused by an actual skin irritant.

Such behaviour ultimately may or may not be classified as "displacement" behaviour. Meantime, it might help to clarify the position if others recorded their views and experiences of behaviour patterns of this type.

Yours faithfully,

A. Brownlee.

Compton,
Nr. Newbury, Berks.
February 24th, 1950.

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Thorpe, W. H. (1948.) The Modern Concept of Instinctive Behaviour. *Bull. Animal Behaviour.* No. 7, p. 8.

Tinbergen, N. (1942). An Objectivistic Study of the Innate Behaviour of Animals. Series D. Bibliotheca Biotheoretica, Vol. I, pars. 2, p. 80. E. J. Brill, Leiden.

THE OCCURRENCE OF *HEPATITIS CONTAGIOSA CANIS* (RUBARTH) IN GREAT BRITAIN

Sir,—Dr. Montgomerie's letter in your issue of February 25th, 1950, concerning *Hepatitis Contagiosa Canis* prompts me to intimate that two cases of Rubarth's disease have been encountered by us in this part of Great Britain within the past three months. One case was in a cross-bred puppy and the other was in a sealyham terrier. Both cases were confirmed by microscopical demonstration of intranuclear inclusions (of basophilic type) in the hepatic cells and in intrasinusoidal mononucleated cells. I should add that we have been on the alert for such cases ever since the appearance of Innes' article in *The Veterinary Record* of April 2nd, 1949.

Yours faithfully,

J. W. Emslie.

Department of Animal Pathology,
University of Glasgow Veterinary School,
83, Buccleuch Street,
Glasgow, C.3.

February 25th, 1950.

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THE REPORT OF PROCEEDINGS UNDER THE DISEASES OF ANIMALS ACTS, 1938-1947

Sir,—Your review and editorial on the Report of Proceedings under the Diseases of Animals Acts for the years 1938-47 (*Vet. Rec.*, February 11th) were disappointing because although they rightly described the important work that has been done, they did not draw attention to the salient defects of the report.

The early reports of the Veterinary Department of the Privy Council were published from 1875 onwards, when the major epizootics were being brought under control (Smith, 1933, Francis, 1949). They were well written, obviously by the C.V.O., and illustrated with maps and graphs: both in the manner of presentation and the grasp of epidemiological facts they were ahead of their day. It is unfortunate that this high standard was not maintained, but that was perhaps a natural consequence of agricultural depression.

Following the Agriculture Act (1937) the name of the Diseases of Animals Division was changed to the Department of Animal Health, and everyone was led to believe that the division would develop a much more positive policy. At the time there were those who thought that the status of the C.V.O. was unsatisfactory, but they were given official assurance that it would increase, or, at the least, not decrease. Yet the pre-war reports of the Proceedings under the Department of Animal Health were always published as the reports of the C.V.O. and were signed by him. The present report is a distressingly anonymous document: one can read it from cover to cover without being able to discover that there is a C.V.O. or even an Animal Health Division. You Sir have not only failed to draw attention to these facts but have disguised them by entitling your leader "The Ministry's Veterinary Report." There is no preamble drawing attention to the main features of the report.

In introducing Part IV of the Agriculture Act in May, 1937, the then Minister of Agriculture stated in the House that: "Our object is to improve the health of our livestock and increase agricultural productivity by seeking to eliminate what is perhaps the worst of all forms of wastage and economic loss in agriculture." Our own agriculture is immensely more important than it was realised to be at that time—it is essentially a livestock agriculture. If one judges by the fact that the present Minister of Agriculture has allowed the C.V.O. and the Animal Health Division to be converted into nonentities one can only assume that he has little appreciation of the need to eliminate "what is perhaps the worst of all forms of wastage and economic loss in agriculture." Still less has he any conception of the need for the Animal Health Division to prepare proper vital statistics which are as essential to the epidemiologist as the *post-mortem* to the pathologist. There are now many varied sources from which proper data could be collected: clearly these should be collated by the Animal Health Division and a comprehensive picture presented.

The most important source of all would be a proper system of meat inspection which should be organised by the Animal Health Division (*Brit. Med. J.*, 1949). So far there is little evidence of any movement in this direction. Again, although it was stated in the White Paper on "Measures to Improve the Quality of the Nation's Milk Supply" (para. 15, page 4) that "the Veterinary staff of the Department who will in any case be visiting the farm at regular intervals to inspect the animals will then also be responsible for the supervision of the conditions under which milk is produced. Under central control it will be possible to bring about greater uniformity of standard and a continuous improvement in that standard." it would appear that the work, taken over from the local authorities, under the Milk and Dairies Orders, has been regarded as relatively unimportant, but an enormously cumbersome administrative machinery has been built up outside the Animal Health Division (see *Vet. Rec.* (1949.) **61.** 829 and 832). The Ministry of Agriculture has created a new Milk and Dairies Regulation Branch although it is not evident that its staff will be as well qualified for the work as the members of the Animal Health Division.

In his presidential address to the Geography section of the British Association Professor Dudley Stamp (1949) began by quoting the statement that "a country has but two ultimate assets—its land and its people." The importance of British agriculture is being slowly realised. It should also be realised that it is no longer enough for the Animal Health Division to administer the Diseases of Animals' Acts, which deal largely with conditions that existed 50 years ago. As already mentioned, it was thought in 1938 that a new and more vigorous attitude would be developed. There can be no doubt that since 1938 the Animal Health Division has in some ways been more vigorous, but the present report provides no indication that the responsible authorities are aware of the importance of this work: the status of the C.V.O. and his department, and, therefore, the field of useful work they can do, appear to have been reduced. These criticisms would be less serious if the veterinary colleges were given adequate support for both research and teaching.

The veterinary investigation service is mentioned, but there is no real description of the work done. It would appear that the Veterinary Investigation Officers make no statistical returns of any sort, although one would imagine that they might provide useful statistical information. The existence of the sterility officers is not mentioned.

The present report covers a period for which the present C.V.O. was not responsible. The report for 1948 is overdue and that for 1949 ought now to be published. One feels sure that some important formal alterations will be made in these reports and that the quality of the report for 1950, at the latest, will bear some relation to the importance of the work which should be in hand.

Yours faithfully,

"Onlooker."

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Francis, J. (1948) *Vet. Rec.* **60.** 253.
Smith, F. (1933.) Early History of Veterinary Literature vol. IV. p. 134. London.
Stamp, D. (1949.) *Agriculture.* **56.** 399.

DISEASES OF ANIMALS ACTS, 1894 TO 1937, AND AGRICULTURE ACT, 1937 (PART IV).

Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

Period	Anthrax	Foot-and-mouth	Fowl Pest	Parasitic Mange*	Sheep Scab	Swine Fever
Feb. 1st to 15, 1950	19	4	6	—	3	—
Corresponding period in—						
1949	8	1	27	—	3	1
1948	10	—	14	1	5	1
1947	4	8	—	—	1	6
Jan. 1st to Feb 15, 1950	56	4	27	—	13	—
Corresponding period in—						
1949	24	1	72	—	10	3
1948	16	—	68	1	15	4
1947	9	49	—	—	13	8

Note.—The figures for the current year are approximate only.

* Excluding outbreaks in Army Horses.